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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/006,903	11/08/2001	Andrew Sendonais	010474	1496

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Qualcomm Incorporated
Patents Department
5775 Morehouse Drive
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EXAMINER	
BAYARD, EMMANUEL	
ART UNIT	**PAPER NUMBER**
2631	

DATE MAILED: 01/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

	Application No.	Applicant(s)
	10/006,903	SENDONAIS, ANDREW
	Examiner	**Art Unit**
	Emmanuel Bayard	2631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 November 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11/08/01*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-31 are rejected under 35 U.S.C. 102(e) as being anticipated by Sih et al U.S. patent No 6,608,858 B1.

As per claims 1 and 22 Sih et al teaches a method comprising: obtaining control symbols from a first wireless signal (see fig.1 and col.1, lines 28-43), the control symbols including pilot symbols and non-pilot symbols (see col.3, lines 1-12; and using both the pilot symbols and the non-pilot symbols for frequency tracking of the first wireless signal (see col.3, lines 1-12 and col.4, lines 45-55).

As per claim 2, Sih et al teaches tracking frequency in different base stations (soft handoff) (see col.3, lines 21-26). Therefore Sih et al inherently teaches wherein using both the pilot symbols and the non-pilot symbols for frequency tracking comprises generating (soft Handoff base stations) (soft decisions) for the non-pilot symbols and using the pilot symbols and the soft decisions for frequency tracking of the first wireless signal.

As per claim 3, Sih et al teaches wherein generating soft decisions for the non-pilot symbols comprises weighting each non-pilot symbol (see figs. 7-8 elements 710, 810 and col.5, lines 19-50 and col.6, lines 20-61).

As per claim 4, Sih et al teaches wherein the soft decisions comprise non-pilot symbols multiplied by a weight factor (see col.5, lines 38-40 and col.11, lines 23-25).

As per claim 5, Sih et al teaches wherein using the pilot symbols and the soft decision for frequency tracking includes calculating a cross product to generate a residual frequency error estimate (see fig.6a and col.4, lines 5-15 and col.6, lines 54-67 and col.7, lines 64-67).

As per claims 6-8, Sih et al teaches a phase rotation. It is well known in the art that phase rotation is defined by multiplying complex or imaginary conjugates or cosine or sinus conjugates with different signal symbols. Therefore Sih et al inherently teaches wherein calculating the cross product comprises cross-multiplying one of the pilot symbols with a complex conjugate of one of the soft decisions.

As per claims 9-10, Sih et al inherently teaches wherein the first set and the second set include at least one common symbol.

As per claim 11, Sih et al teaches comprising adjusting frequency of the first Wireless signal in response to the frequency tracking (see col.5, lines 1-10 and col.7, lines 63-67).

As per claim 12, Sih et al inherently teaches wherein the soft decisions include a decision as to whether the symbol is a 1 or a -1 and a confidence level of the decision as to whether the symbol is a 1 or a -1.

As per claims 13-14 since the phase rotation of Sih is composed of cosine and sinus conjugates, applying a hyperbolic tangent function to calculate the soft decision will be inherently taught by Sih.

As per claim 15, Sih et al inherently teaches wherein generating the soft decision includes using a sign function to calculate a decision as to whether the non-pilot symbol is a 1 or a -1.

As per claim 16, Sih et al teaches wherein the first wireless signal is a spread spectrum CDMA signal (see col.3, line 1).

As per claim 17, Sih et al teaches wherein weighing each non-pilot symbol includes weighing each non-pilot symbol according to strength of the first wireless signal (see col.6, lines 23).

As per claim 18, Sih et al teaches wherein weighing each non-pilot symbol includes weighing each non-pilot symbol according to a signal-to-noise-plus interference ratio associated with the first wireless signal (see col.2, line 10).

As per claim 19, Sih et al teaches comprising calculating cross-products to calculate residual frequency error estimates and accumulating the cross products to calculate an estimated frequency error of the first wireless signal (see col.3, lines 4-13 and col.4, lines 5-15).

As per claim 20, Sih et al inherently teaches wherein the non-pilot symbols include transport format combination indicators, transmit power control indicators and feedback indicators.

As per claim 21, Sih et al teaches a method comprising: obtaining control symbols from a first wireless signal (see fig.1 and col.1, lines 28-43), the control symbols including pilot symbols and non-pilot symbols (see col.3, lines 1-12); assigning a weight factor (see figs. 7-9 elements 710, 810, 910 and col.5, lines 19-50 and col.6, lines 20-61) to each non-pilot symbol; and using the pilot symbols and weighted non-pilot symbols for frequency tracking of the first wireless signal (see col.3, lines 1-12 and col.4, lines 45-55).

As per claim 23, Sih et al teaches an apparatus comprising: a rotator (see figs. 7-9 elements 706a, 806a, 906a) that adjusts signal frequency of a signal; and associated with the signal, wherein the feedback loop generates the estimate of the frequency error using pilot and non-pilot symbols (see and col.6, lines 15-67 and col.7, lines 10-23).

As per claim 24, Sih et al teaches further comprising: a transmitter/receiver (see col.2, line 51) that receives and conditions the signal before sending the signal to the rotator (see col.5, lines 33-50); a demodulator (see figs.6a, 7-9 elements 610, 700a, 800a, 900a and col.7, lines 65-66) that demodulates the signal after the rotator has adjusted signal frequency of the signal; a symbol generator is inherently taught by Sih that obtains the pilot and non-pilot symbols (see fig.3 and col.3, lines 1-14); and a digital signal processor (see fig.3 element 300 and col.3, lines 8-10) that processes the pilot and non-pilot symbols.

As per claim 25, Sih et al teaches a frequency discriminator (see fig.6a element 600) and an accumulator (see col.3, lines 4-15), wherein the frequency discriminator

calculates residual frequency error estimates using the pilot and non-pilot symbols and sends the residual frequency error estimates to the accumulator to generate the estimate of the frequency error (see col.4, lines 5-15 and col.6, lines 42-65).

As per claim 26, Sih et al teaches tracking frequency in different base stations (soft handoff) (see col.3, lines 21-26). Therefore Sih et al inherently teaches wherein the feedback loop includes a soft decision generator that generates (soft handoff base stations) (soft decisions) for the non-pilot symbols, wherein the frequency discriminator calculates residual frequency error estimates using the pilot symbols and the soft decisions.

As per claim 27 since the phase rotation of Sih is composed of cosine and sinus conjugates, applying a hyperbolic tangent function to calculate the soft decision will be inherently taught by Sih.

As per claim 28, Sih et al teaches wherein using the pilot symbols and the soft decision for frequency tracking includes calculating a cross product to generate a residual frequency error estimate (see fig.6a and col.4, lines 5-15 and col.6, lines 54-67 and col.7, lines 64-67).

As per claim 29, Sih et al teaches wherein the apparatus forms part of a RAKE receiver, the apparatus further comprising: a number of rotators (see figs.7-9 elements 706a- 706n, 806a-806n, 906a-906n) that adjust signal frequency of a number of signals tracked by a number of fingers; and a number of feedback loops (see figs.7-9 elements 704a-704n, 804a-804n 904a-904n) to the number of rotators that provide estimates of

frequency errors associated with the signals, wherein the feedback loops generate the estimates of the frequency errors using pilot and non-pilot symbols.

As per claim 30, Sih et al teaches an apparatus comprising: an antenna (see fig.2 element 200 and fig.4); transmitter/receiver (see col.2, line 51) coupled to the antenna that receives a signal and conditions the signal; a rotator (see figs.7-8 elements 706a, 806a, 906a) coupled to the transmitter/receiver that adjusts frequency of the signal (see col.5, lines 33-50); a demodulator a demodulator (see figs.6a, 7-9 elements 610, 700a, 800a, 900a and col.7, lines 65-66) coupled to the rotator that demodulates the signal; a symbol generator is inherently taught by Sih et al (see fig.3 and col.3, lines 1-14) coupled to the demodulator that obtains control symbols from the demodulated signal, the control symbols including pilot and non-pilot symbols; Sih et al teaches tracking frequency in different base stations (soft handoff) (see col.3, lines 21-26). Therefore Sih et al inherently teaches a soft decision generator that generates (soft handoff base stations) (soft decisions) for the non-pilot symbols; a frequency discriminator (see fig.6a element 600) coupled to the soft decision generator that calculates residual frequency error estimates using the pilot symbols and the soft decisions; and an accumulator (see col.3, lines 4-15) coupled to the frequency discriminator and the rotator that accumulates an error estimate associated with the signal, wherein the rotator adjusts frequency of the signal based on the error estimate associated with the signal (see col.4, lines 5-15, 33-50 and col.6, lines 42-65).

As per claim 31, Sih et al teaches, wherein the apparatus forms part of a RAKE

Receiver (see col.3, lines 1-2 and col.6, lines 1-2, the apparatus further comprising: a number of fingers (see figs. 7-9 element 700a-706n) that track a number of signals, wherein each finger includes a rotator (see element 706a), a demodulator (see fig.6a element 610 and col.7, lines 63-67) coupled to the rotator, a symbol generator a symbol generator is inherently taught by Sih et al (see fig.3 and col.3, lines 1-14) coupled to the demodulator. Therefore Sih et al inherently teaches a soft decision generator (soft handoff base stations) (soft decisions) coupled to the symbols generator; a frequency discriminator (see fig.6a element 600) coupled to the soft decision generator, and an accumulator (see col.4, lines 5-15, 33-50 and col.6, lines 42-65) coupled to the frequency discriminator and the rotator.

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Zehavi U.S. patent No 5,602,833 teaches a method and apparatus for using walsh shift keying.

Lee et al U.S. patent No 5,649,000 teaches a method and apparatus for providing a different frequency handoff.

Cai et al U.S. patent No 5,960,040 teaches a communication signal processors and methods.

Crawford U.S. patent No 6,633,616 B2 teaches an OFDM tone tracking for wireless Lan.

Sih et al U.S. patent No 6,704,555 B2 teaches an apparatus and method for calibrating local oscillation.

Zehavi et al Pub 20040013209 A1 teaches a GFSK receiver.

Doty et al U.S. patent No 6,520,448 B1 teaches a spinning-vehicle navigation using apparent modulation of navigational signals.

Agrawal et al U.S. patent No 6,134,215 teaches using orthogonal waveforms.

White U.S. patent No 6,088,402 teaches a QAM spread spectrum demodulation.

Levanon et al U.S. patent No 6,327,534 B1 teaches an unambiguous position determining using two low-earth orbits.

Chrisikos U.S. patent No 6,728,301 B1 teaches a system and method for AFC in spread spectrum communications.

Sih et al U.S. Pub No 20030086481 A1 teaches an apparatus and method for scalable offline CDMA demodulation.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emmanuel Bayard whose telephone number is 571 272 3016. The examiner can normally be reached on Monday, Wednesday and Friday (6:30AM-6:30PM) .

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammed Ghayour can be reached on 571 272 3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Emmanuel Bayard
Primary Examiner
Art Unit 2631

1/4/05

EMMANUEL BAYARD
PRIMARY EXAMINER